TECHNOLOGY DEPARTMENT

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SCIENCE NEWS LETTER

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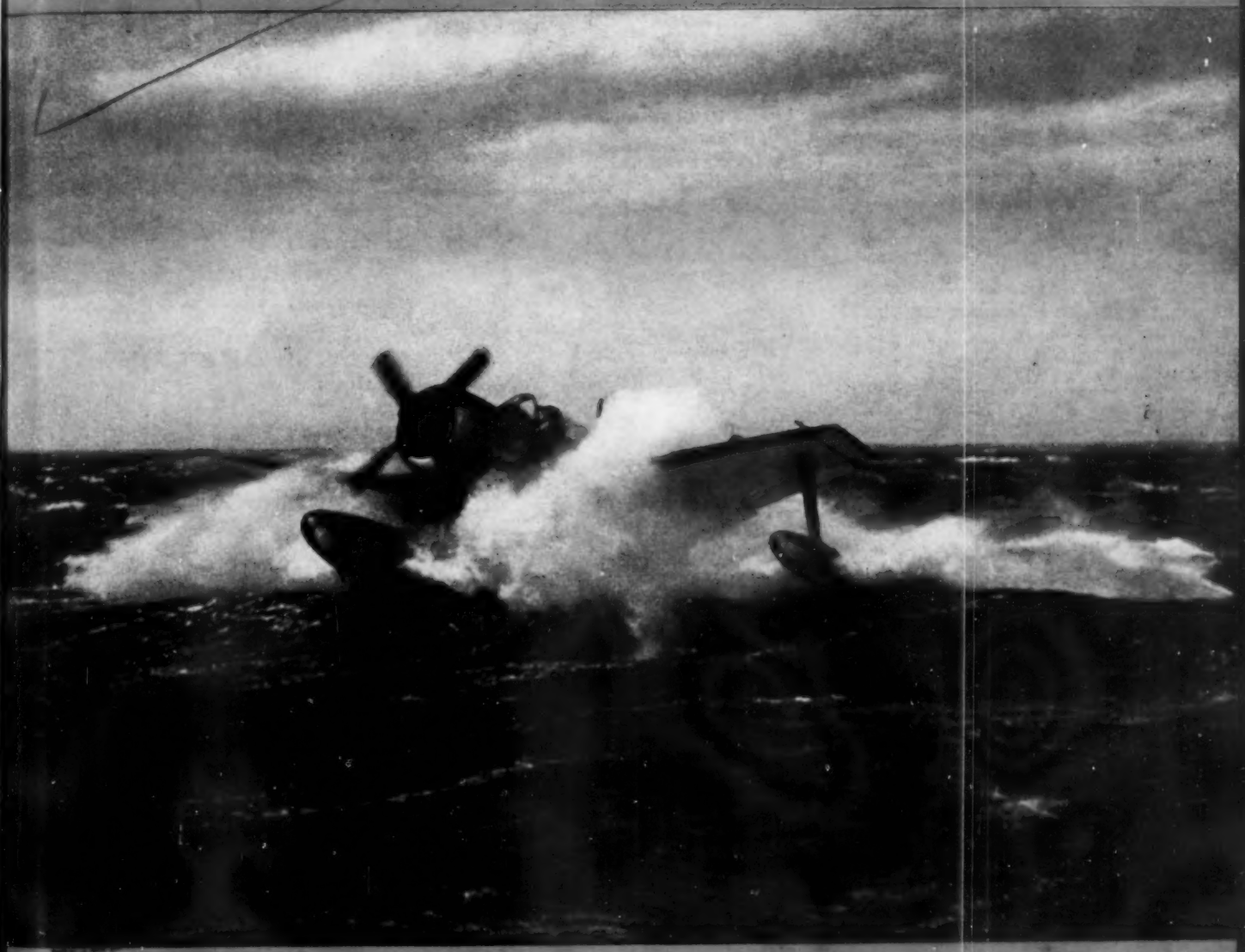
THE WEEKLY SUMMARY OF CURRENT SCIENCE AUG. 16, 1947



Seahawk

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TECHNOLOGY DEPT.

MEDICINE

Morphine Substitute Made

Synthetic drug is more powerful than morphine and can be manufactured in U. S., thus insuring a supply of a pain-killing drug. It is habit-forming.

➤ HUNDREDS of patients have been relieved of pain during this past year by a new synthetic drug under trial as a substitute for morphine. Your doctor will probably be using it soon.

The new drug is two to four times as potent a pain-killer as morphine. It has the further advantage of being a synthetic chemical. This means it can be manufactured here in the United States.

If there is trouble in Turkey or elsewhere in the East that cuts off our supply of opium, as the last war cut off our supply of quinine, patients with cancer, gallstones and excruciatingly painful diseases of the blood vessels will not have to suffer because of a lack of an effective pain-relieving drug.

Its chief, if not only, disadvantage is that it can be habit-forming, somewhat as morphine is.

The new drug has been known by three different names: amidone, dolophine and 10820. American manufacturers may give it still other names. Its chemical name is a real jaw-breaker: 4-4-diphenyl - 6 - dimethylamino-heptanone-3.

War-Time Product

It was first made during World War II by chemists at the I. G. Farbenindustrie in Germany. Our intelligence officers heard in 1943 that the Germans were working on a synthetic morphine substitute, but they got no further information until after the occupation of Germany. Then, in 1945, an Army Medical Corps team investigating the German drug industry picked it up and brought some back to the United States. Chemists, pharmacologists and other medical scientists started making and studying it.

Their studies were kept pretty hush-hush. All of them were worried about whether the new drug could cause addiction as morphine can. Until they could be sure, they did not want any of it finding its way to the market, legitimate or illicit.

Federal authorities in the Bureau of Narcotics and the Public Health Service were particularly worried. They did not want to see the history of heroin and demerol repeated.

Heroin is a chemical relative of morphine. When it was first introduced it was supposed not to be habit-forming. It turned out to be the worst of all drugs in this respect and its importation into the United States is now illegal.

Demerol Not from Opium

Demerol, unlike heroin and morphine, is not derived from opium. It is another synthetic chemical which came out of Germany just before the war. It was widely publicized as being without addiction properties. It went on the market without being under control of the narcotic law and doctors began using it. They read accounts of its safety, missed seeing reports casting doubt on this. And a lot of demerol addicts turned up at the Public Health Service Hospital in Lexington, Ky. Popularly known as the "narcotic farm," this is the federal institution for the study and treatment of narcotic drug addiction.

It took a fight and an act of Congress to get demerol under control as an addiction, or habit-forming, drug.

Amidone, like demerol, is not derived from opium. But scientists at the U. S. Public Health Service have found that it is similar to morphine and other opiate drugs in its ability to produce addiction in animals and man.

It gives morphine addicts the same "bang," the same pleasant feeling of exhilaration as morphine itself does. When given over long periods of time physical dependence on the drug developed so that it had to be continued to prevent a characteristic withdrawal illness. But it relieves and prevents the appearance of symptoms of the illness seen after morphine addicts have their drug taken away from them. It may therefore be valuable not only for relieving pain but for treating the withdrawal sickness from morphine.

The Public Health Service authorities consider amidone a useful drug for relief of pain, particularly when a pain-killer has to be given over long periods of time. But they believe that unless its manufacture and use are controlled, addiction to amidone will become a "serious public health problem."

Some doctors who have been using it have reported that they did not see any signs of addiction to the drug. But this does not mean that the drug cannot cause addiction or a drug habit. In these cases the drug was not used for long enough periods to learn whether or not it would cause addiction. Many of the doctors who have been using it on trial have been chiefly interested in determining its value in relieving pain and in learning whether it had objectionable features such as causing nausea, drowsiness and dizziness, heart symptoms or sensitivity reactions. For the most part, it did not.

The drug can be given by mouth or by hypodermic injection under the skin, into the muscles or into the veins.

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CHEMISTRY

First Ipatieff Chemistry Prize Awarded To Dr. Schmerling

➤ FIRST AWARD of the Ipatieff Prize in chemistry has been made to Dr. Louis Schmerling of the Universal Oil Company.

Dr. Vladimir N. Ipatieff, director of the Ipatieff High Pressure and Catalytic Laboratory at Northwestern University, will present the $3,000 award and a certificate to Dr. Schmerling on Sept. 15 at the American Chemical Society's national meeting in New York. Dr. Schmerling was cited for his work in the chemistry of petroleum and natural gas.

The prize, established by Dr. and Mrs. Ipatieff, will be given every three years to a chemist under 40 years of age for outstanding studies with high pressures or catalysts.

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INVENTION

Canvas Holds Body Armor

➤ NOVEL body armor is the subject of patent 2,424,985, issued to Dana C. Howard of the Army's Springfield Armory and licensed royalty-free to the government. It consists of a canvas holder covering the front of the body, with horizontal pockets into which overlapping V-shaped metal plates can be inserted.

Science News Letter, August 16, 1947

California produces 99% of the *olives* grown in the United States.

GENERAL SCIENCE

Research Support Blocked

Government support of scientific research was postponed for an indeterminable length of time by the veto of the National Science Foundation bill.

By WATSON DAVIS

➤ BY WITHHOLDING approval of the national science foundation bill and preventing it from becoming law, President Truman has postponed full-scale government support of basic scientific research for at least six months, probably for two years and perhaps longer.

The bill, given pocket veto after passage by both houses, was the result of two years of hearings, debate and compromises in congress. For a year earlier at the request of President Roosevelt, a committee headed by Dr. Vannevar Bush, director of the wartime Office of Scientific Research and Development, worked on a plan for peacetime government support of science and brought forth recommendations that did not differ markedly from the provisions of the bill finally passed.

The Bush plan of power vested in part-time scientific board won out over the single, responsible administrator type of organization vigorously favored by President Truman, the then Secretary of Commerce Wallace and the budget bureau. Both the House and Senate voted down the in-line customary type of organization, preferring to make a group of scientists responsible.

Single Administrator Preferred

Polls among representative scientists showed that they favored heavily at the opening of the 80th congress the single administrator with advisory committees. But when Congress decided upon a foundation membership of 24 serving part-time, 99 out of a hundred scientists went along with this provision, confident that this administrative plan would work fairly and effectively. They pointed to the National Advisory Committee for Aeronautics as a good example of a part-time committee that has administered research successfully for the government since World War I.

Scientists in all fields are disappointed that the national foundation bill did not become law. Some of them point out that control of research funds available for grants are left, by default, largely in the hands of the Army, Navy and Air Force. They admit that military funds have kept in operation research projects of importance generally, not alone to defense. But they want to see research predominantly in civilian hands and the military research bureaus have agreed with them.

Scholarships for young research scientists were authorized in the bill as an aid to filling the depleted ranks of scientific investigators. This is considered one of the most important functions of the foundation, now delayed.

Both political parties are in favor of science, you may be sure, and the few members of congress who opposed the unsigned bill were careful to go on record for science research. While the unsigned bill, S.526, was a Republican majority measure, it had strong Democratic support and was based solidly on previous bills of the 79th congress.

Whether Congress will reconsider the matter of a national science foundation in its pre-election session in January and enact a bill more to his liking, as President Truman hopes, is problematical. Real hopes for a national science foundation may be unjustified. Scientists confronted by some of the world's greatest and most urgent problems will have to do the job with what they now have. The government reinforcements aren't coming.

Truman's Objections

Excerpts from President Truman's Memorandum of Disapproval:

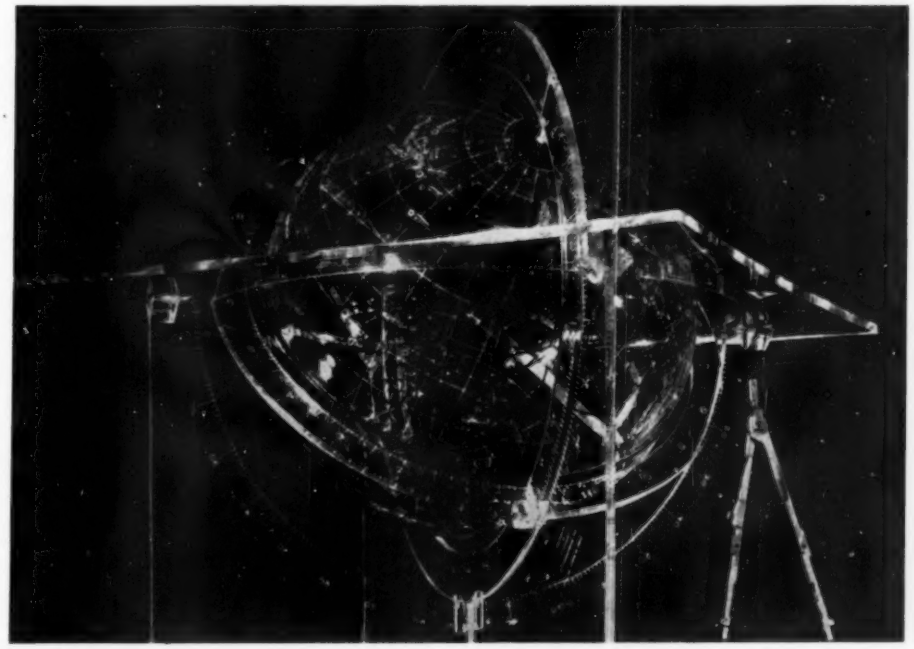
"I am witholding my approval of S. 526, the National Science Foundation Bill.

"I take this action with deep regret.

"The proposed National Science Foundation would be divorced from control by the people to an extent that implies a distinct lack of faith in democratic processes.

"The Government's expenditures for scientific research and development activities currently amount to hundreds of millions of dollars a year. Under present world conditions, this work is vital to our national welfare and security. We canot afford to jeopardize it by imposing upon it an organization so likely to prove unworkable.

"Apart from the conflicts and confusion which would result from this complex organization, the bill would



CELESTIAL GLOBE—For armchair astronomers and civilian navigators, this Plexiglas globe presents the heavens in a graphic picture. It is a working model of the universe and can be adjusted to show the position of the stars at any given season or time of day.

violate basic principles which make for responsible government.

"There are other compelling reasons why control over the administration of this law should not be vested in the part time members of the Foundation.

"Adherence to the principle that responsibility for the administration of the law should be vested in full time officers who can be held accountable will not prevent the Government from utilizing with great advantage the services of eminent scientists who are available only for part time duty.

"It is unfortunate that this legislation cannot be approved in its present form. The withholding of my signature at this time, however, will not prevent the the Government from engaging in the support of scientific research.

"We must start with a law which is basically sound.

"I hope that the Congress will reconsider this question and enact such a law early in its next session."

From National Research Council:

Excerpts from Statement by Dr. Detlev W. Bronk, Chairman, National Research Council.

"The President has rightly said that national security and welfare require that direct federal support be given to basic scientific research and to increasing the number of trained scientists. Accordingly, it is regrettable that differences of opinion between the legislative and executive branches of the government regarding administrative policies have barred the creation of a National Science Foundation, which would have fostered scientific research throughout the country to the general advantage of the American people.

"The need for such a foundation is great at the present time when universities are hard-pressed for funds with which to carry on essential research and when the ranks of adequately trained scientists are seriously depleted.

"Scientists generally will therefore hope that these needs may be met by the passage of legislation in the next Congress which will satisfy both Congress and those concerned with executive function and which will preserve the traditional freedom of the scientific investigator."

Senator Smith's Opinion:

"It is a great regret to me that the President has made a 'political football' out of what undoubtedly would have been the greatest contribution made in this country by any Congress since the turn of the century. I believe the cause of science has been set back 10 years by his action," states Sen. H. Alexander Smith, Rep., N. J.

National Academy Head:

Comment on veto by Dr. Alfred N. Richards, president of the National Academy of Sciences:

"Too bad."

Dr. Karl T. Compton States:

"The veto of the National Science Foundation Bill is disappointing at a time when help and encouragement are needed. Practically everyone agrees that the universities and colleges cannot contribute their part in meeting the postwar scientific needs of the country on their prewar basis of financial support, and everyone knows that national security and prosperity require assiduous attention to science and the training of scientists.

"I believe the President was poorly advised on this action. I believe that the values of getting the program going promptly outweigh the objections to the form of the bill, which could be corrected later if in practice they proved serious." Dr. Compton is president of Massachusetts Institute of Technology.

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PHYSICS

Very Accurate Gauges Ground from Spheres

➤ GAUGES for highly accurate measurement of bore-holes are the subject of patent 2,423,094, issued to Dr. I. C. Gardner of the National Bureau of Standards. It is relatively easy to grind spheres of precisely known diameter from such hard stones as agate or from hard glass or fused quartz. From such spheres, cylinders or polygonal prisms may be cut, each retaining at its opposite ends a part of the original, accurately determined diameter. These constitute the gauges. Rights to manufacture and use are assigned royalty-free to the government.

Science News Letter, August 16, 1947

The Iowa cornfield thrives partly because its *calcium* content was high to begin with; the lime came from limestone ledges, ground in the great mill of the Ice Age glaciers or more recently weathered into soil.

CHEMISTRY

Stable Plastic from Rosin

➤ ROSIN is polymerized into a firm, chemically stable plastic of high melting-point through the use of the bromine or chlorine salts of mercury as catalysts, in the process on which B. L. Hampton of Jacksonville, Fla., has been granted patent 2,424,979. These catalysts replace the halides of tin and zinc used in an earlier process. Patent rights are assigned to the Glidden Company of Cleveland.

Science News Letter, August 16, 1947

Male otters when startled make a noise that resembles the "barking" of a sea lion.

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CHEMISTRY

Extinct Elements Found

The neptunium series, heavy radioactive elements, may have existed naturally in the earth's beginning but because of short lives have become extinct.

➤ A PREHISTORIC family of heavy radioactive elements which may have occurred naturally in the earth's beginning but now is extinct was unearthed during development of the atomic bomb.

This missing link in the periodic table was found with production of synthetic elements neptunium, americium and uranium 233. It includes the recently identified elements 85 and 87, explaining fully for first time the absence of these elements from nature.

Called the neptunium series because neptunium 237 is the longest-lived of the family, it is the missing one of our four series of heavy radioactive elements. The others are the uranium, thorium and actinium series.

Two parallel investigations are reported in the *Physical Review* (Aug. 1). One was headed by Dr. Glenn Seaborg, of the University of California, while he was at Chicago, with co-authors listed as Drs. French Hagemann, Leonard Katzin, of Argonne, Martin Studier, Chicago, and Albert Ghiorso, University of California. The second study was by Canada's Division of Atomic Energy.

One of the authors of the Canadian report was Dr. Alan Nunn May, who is now serving a 10-year sentence in Britain for revealing atomic research data to Soviet Russia. Other Canadian scientists reporting on the work were A. C. English, T. E. Cranshaw, P. Demers, J. A. Harvey, E. P. Hincks and J. V. Jelley.

The reason for the extinction of the newly-discovered series is the relatively short half-life of parent, neptunium, which is two million years. The age of earth is estimated at two billion years.

Neptunium, like other heavy radioactive elements, decays by alpha particles, until it reaches a stable isotope. It decays to uranium 233, the synthetic isotope made by bombardment of thorium, and then down through isotopes of radium, actinium, francium, astatine and polonium until it reaches stable bismuth 209. Americium, element No. 95, is an even more remote ancestor of series with half life only 500 years.

The other three series exist in nature because of the long half-lives of the parents, these being four and half billion years for uranium 238, fourteen billion years for thorium 232 and seven hundred million years for uranium 235. The latter isotope was not known when the actinium series was named, but it is the actual parent.

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ZOOLOGY

Sickly Baby Gorilla Spends Record Time in Captivity

➤ AN 11-POUND, year-old baby which experts figured would not live long, today is a healthy six-footer weighing approximately 435 pounds.

He is Bamboo, famed gorilla who has spent 20 years in the Philadelphia Zoo. Two decades in captivity is a record for gorillas. Before Bamboo arrived here, most gorillas lived only a short time after capture.

Now, scientists believe Bamboo is right in his prime. His quarters have been strengthened by extra bars since the gorilla wandered out of his cage recently. How much longer Bamboo will live cannot be estimated with any accuracy. No one knows how long gorillas live normally in the wilds of Africa.

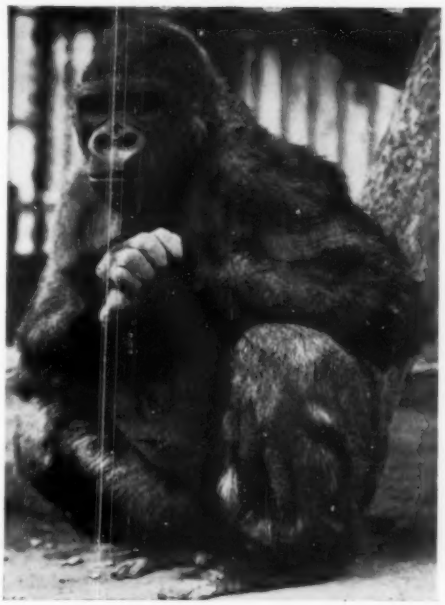
Science News Letter, August 16, 1947

MEDICINE

Dye Glows Under Rays To Detect Cancer Tissue

➤ A DYE that glows under ultraviolet light may help detect cancer tissue for the surgeon to remove. At present, bits of cancer that have invaded and become hidden by normal tissue may be missed at operation.

Trials of this method in 46 patients are reported by Dr. George E. Moore, National Institute of Health fellow at the University of Minnesota Medical School. His report appears in *Science* (Aug. 8).



BAMBOO—This gorilla, once a sickly baby, has been in captivity 20 years, a record time.

Best results were obtained when the dye, sodium fluorescein, was injected into the patient's vein three to eight hours before operation. During the operation, when the surgeon has reached the point where the patient's stomach, for example, can be seen, he inspects the area with an ultraviolet lamp. Cancer tissue glows with a vivid yellow color, showing the surgeon where to cut to remove it.

Good results were obtained in 31 of the 46 cases. Most of the nine failures occurred in attempts to fluoresce large, bulky tumors within the abdomen. Cancers of the lower intestine, stomach and breast were found less likely to fluoresce. This might be due to insufficient amount of dye or insufficient time between its injection and the ultraviolet inspection.

The most consistent results were obtained in examination of brain tumors. A bit of tissue from suspected areas was sucked out with a needle and readily recognized by its exaggerated fluorescence under ultraviolet light.

The use of radioactive iodine is now being considered for aid in distinguishing more accurately between cancerous and non-cancerous tissue at operation. Certain mouse tumors could be seen better by X-ray when iodine was substituted in the dye, which suggested putting the radioactive form of iodine into the dye.

Science News Letter, August 16, 1947

RADIOACTIVITY

Disease Virus "Tagged"

First move has been made to find out how viruses enter the body and wage their destructive war. One virus has been "tagged."

➤ DISEASE-CAUSING viruses have become "it" in an exciting game of radioactive atomic "tag".

What is believed to be the first radioactive "tagging" of a disease-causing virus has been accomplished by Dr. Raymond L. Libby and Caroline R. Madison of the American Cyanamid Company's research laboratories in Stamford, Conn.

Scientists are now hopeful that they have made the first move toward finding out why one child catches polio and another does not, why some get colds and others don't, and how important food plants resist their virus attackers.

This latest advance is the indirect result of atomic bomb research because the radioisotopes used were manufactured in one of the giant atom smashers used in the successful attack on the atom.

The virus used in the Stamford experiments was that of tobacco mosiac. It is one of the best known of the puzzling proteins that are not alive yet act in many respects like living parasitic organisms. It was given its radioactive "tag" by inoculating it into tobacco seedlings which were then fed with radioactive phosphorus as part of their mineral nutrient solution. The virus acquired its radioactivity from its host.

After the virus had been "tagged" it was extracted, purified, and injected into the bodies of laboratory mice to study their reaction to it as an alien protein. The response of the animals' systems was two-fold: the formation of an immunity-conferring antibody in their blood serum, and the concentration of the radioactive virus largely in liver and spleen.

Now that the way has been shown, other workers will be able to "tag" this and other viruses, and use them in various researches. Of great importance would be the study of mode of entry into, and route of migration within, the body of a number of virus diseases of man and animals, ranging all the way from the common cold to infantile paralysis. Another study might be on the structure of the relatively huge and highly complex virus molecules themselves, and especially on how they "feed" on their hosts' body compounds. Possibilities are endless, especially now that practically unlimited quantities of "tagged" elements are becoming available from the atomic pile of the Atomic Energy Commission at Oak Ridge, Tenn.

Science News Letter, August 16, 1947

RADIO

Colored Pictures by Radio

➤ COLORED pictures can now be received in home or office by wire or radio waves in much the same way that newspaper photographs are now received, it is claimed. They are transmitted by a new type of facsimile system.

In ordinary facsimile, pictures or printed pages are received in black and white on photographic paper, recordings being made by a beam of light, varying in intensity. In the new full-color system, the picture is reproduced with colored lead. Sensitized paper is unnecessary; ordinary paper can be used.

The new device is called "colorfax" by its inventors, Capt. W. G. H. Finch and Dr. LaVerne R. Philpott of Finch Telecommunications, Inc. The pictures can be seen as received, and need no developing or processing in any way.

The printing mechanism is described by the inventors as something to remind one "of a small airplane motor with four cylinders at right angles to each other revolving around a central shaft. Each cylinder is loaded with a colored lead equal to a primary color, yellow, red, blue and black. As each cylinder revolves the colored leads are applied to the paper and record a line of multicolor. Then the paper moves upward a hundredth of an inch, and the next line is recorded. The copy is made at the rate of four square inches a minute."

Sending pictures, maps, charts and printed matter by wire or radio waves is not new, but recent developments have greatly broadened its applications. Basically, the process consists in putting the copy to be sent on a revolving cylinder where it is scanned by a sharp beam of light which crosses the copy in a succession of closely-spaced parallel lines. The reflected light falls on a photo-electric cell which sends out signals corresponding to the amount received by it.

These signals are amplified and sent to the receiving instruments. In them the process may be said to be reversed. The photocell that picks them up sends a beam of light in successive parallel lines across the face of a photographically sensitized paper on which the copy is reproduced. The varying intensity of the light from the signals causes a variation in photographic action, resulting in the picture or facsimile copy.

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MEDICINE

New Chemical Under Trial As Remedy for Filariasis

➤ A NEW, arsenic-containing chemical is now under trial as a remedy for filariasis in dogs and man. This worm-caused tropical disease caused great worry to many of our fighting men in the South Pacific because late, untreated stages of it develop into elephantiasis.

The new chemical is announced by Drs. G. F. Otto and T. H. Maren, of the Johns Hopkins Schools of Medicine and Hygiene and Public Health, in *Science* (Aug. 1). It is known as Tropical Disease Center No. 970, has a 16-syllable chemical name and its simplest chemical description is substituted phenyl arsenoxide. It was first made in the scientists' laboratory at Johns Hopkins and later by Parke, Davis and Co.

It is the first chemical ever discovered, so far as is known, that will kill all the grown-up worms of filariasis in doses that can be given to man. Filariasis has previously been treated with antimony compounds. These, however, only remove the baby or embryonic worms, called microfilariae, from the blood. It is the grown-up worms that are believed to be responsible for blocking the lymph channels and causing the grotesque and often horrible swellings of elephantiasis.

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AERONAUTICS

Army Observation Plane Completing Flight Tests

➤ THE NEW Army plane, now under flight tests in Wichita, is a strange-looking craft in general appearance but it can take off and land on very short runways. It is for observation purposes, and will be delivered to the Army later this month by Boeing Aircraft Company, its builder.

It is a monoplane, with wings, conical boom from wings to tail, and inverted tail surfaces all in one assembled piece. Below the wings and the fore part of the boom is suspended a passenger-carrying boat-shaped body for pilot and observer. This houses its 125-horsepower Lycoming engine. Propeller blades are on its fore end, and landing wheels below.

The plane is designed to take off and clear a 50-foot obstacle in 600 feet. It can climb at 628 feet per minute, cruise at 100 miles an hour, and land at 35 miles an hour. It is approximately 26 feet long, and has a wingspan of 40 feet. Its gross weight is a little over a ton.

Pilot and observer in the plane have unobstructed view at all times. Large windows which slope inward at the bottom permit observation directly downward, while a transparent section overhead offers a clear upward view.

In the Army, the plane will be known as the XL-15. It is, in Army language, a liaison plane to be used in connection with Ground Forces operations.

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PHYSICS

Electric Photocell Detects Carbon Monoxide in Plane

➤ CARBON MONOXIDE, which can be even more dangerous in airplanes than it is in automobiles, is detected photoelectrically in the device on which patent 2,425,059 has been awarded to William F. Fagen of Chicago, assignor to the Stewart-Warner Corporation. A continuous sample of the air supplied to the plane's cabin is passed through a tube containing a gel that turns dark blue in the presence of carbon monoxide. A light beam that passes through the gel in its normal state is dimmed, hence fails to excite the photocell on which it is directed. This change in current, suitably stepped up, operates a relay and gives warning.

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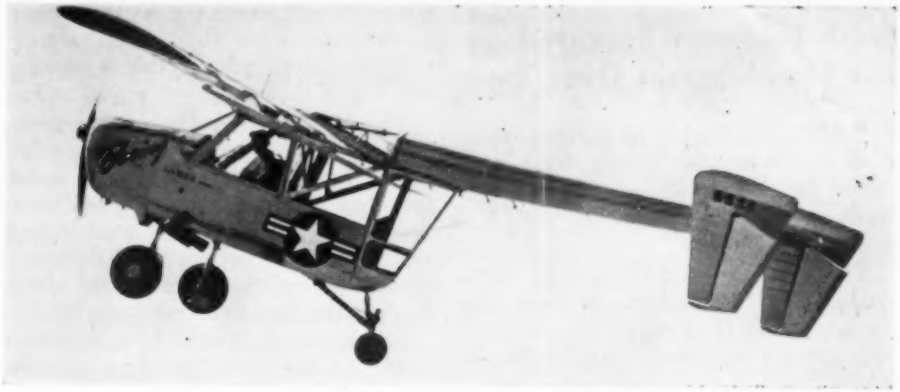


NEW LIAISON—The L-15 will be used for directing artillery fire, reconnaissance, aerial photography and emergency supply missions.

TELEPHONY

Train Telephone Service

Persons on trains can now talk with their offices or homes. Experiment is being tried on several trains running between Washington and New York.

➤ TELEPHONE conversations between offices or homes and passengers on board speeding trains became available Aug. 15, the Federal Communications Commission has announced.

An experimental service of this nature was inaugurated on that date on several Pennsylvania and Baltimore and Ohio trains between Washington and New York. Tariffs, now filed with the commission, are comparable with similar rates for regular long-distance calls.

The plan is part of the Bell system's work on a radiotelephony program to develop apparatus and methods to bring the telephone network within reach of persons on trains, automobiles, airplanes and surface ships. An experimental installation for telephone service on the famous Boston Post Road connecting that city with New York was started nearly a year ago. In that system six 250-watt land transmitters are used. One is at each end of the line, and the other four at way stations. It is similar to the system already in use in several American cities which provides telephone service between homes or offices and moving taxicabs or delivery trucks.

Induction telephone service, a different type from the other installations planned, is proposed by the Chesapeake and Ohio Railway Co., for passengers' use between Orange, Va., and Cincinnati. The installation will cost nearly $360,000, company officials estimate. Standing by itself, it would not be a profitable venture but the availability of the service is expected to attract additional travel.

This railroad telephone service for passengers is not the same as the radio service for train crews now in operation on many railroads and in a number of freight and terminal yards. About 100 authorizations for this type of service have already been given by government authorities. They cover some 75 land stations and 700 mobile units, since a single grant may cover from one to a hundred radio installations on engines and cars.

This railroad radio service, as it is called, was inaugurated Dec. 31, 1945, after it was shown that use of radio would benefit both the public and the industry. It was developed by the Federal Communications Commission in collaboration with the Association of American Railroads, and incorporates a geographical assignment plan to insure the utmost use of available frequencies. Wartime development of very high frequency transmission has made it possible to design radio equipment to meet the particular needs of railroads.

Science News Letter, August 16, 1947

MEDICINE

Fresh Evidence Reported For Streptomycin Over TB

➤ FROM the bodies of patients who died of tuberculosis comes fresh evidence for the power of streptomycin, medicine's new weapon against the great white plague.

The evidence is presented by Drs. Archie H. Baggenstoss, William H. Feldman and H. Corwin Hinshaw of the Mayo Clinic and Foundation in Rochester.

It is the kind of evidence, from microscopic examination of TB-infected brain, lungs, liver and spleen, that is especially convincing to medical men.

The patients died of miliary and meningeal tuberculosis. In these forms of the disease the germs are widespread throughout the body, and the meninges which cover the brain are also attacked. Before the discovery of streptomycin, patients attacked by these severe forms of TB always died.

In the dead bodies of four such patients who had been treated with streptomycin, the Mayo scientists found evidence of regression and healing of the tuberculous spots in lungs, liver, spleen and eye which in one case had been affected.

Development of widespread tuberculous meningitis apparently was checked in one case and either prevented or cured in two other cases.

The scientists also looked for evidence of damage from the drug. They found no sign of it with the possible exception of kidney damage in one case.

Their observations, they state, offer "further encouraging evidence" of the effectiveness of streptomycin as a TB remedy and "some hope for the effective treatment of two hitherto consistently fatal forms of the disease."

Science News Letter, August 16, 1947

FORESTRY

"Wetter" Water Produced For Fighting Forest Fires

➤ MAKING WATER wetter is the latest method of fighting forest fires.

To those of you who think that water is already wet enough to put out fires, it can be explained that the so-called "wetting agent" is a chemical that reduces the surface tension of the water so that it will flow better, spread out, and soak into materials instead of forming beads and remaining on the surface as droplets. Thus the "wetter water" will penetrate and get things soaking wet better than ordinary water.

The U. S. Forest Service is experimenting with several of these wetting agents in the hope that, added to water, they may be useful in putting out small fires especially in grass, needles and weeds and for "mopping up" the smoldering fire on the ground after blazes in the trees have been put out.

Many wetting agents are now known and have been used as detergents in place of ordinary soap and in the textile industry to facilitate dyeing.

Among those being tried out in forest fire fighting are Drench, P-2N sulfonate, and Tergitol.

Science News Letter, August 16, 1947

CHEMISTRY

X-Rays May Solve Mystery Of Structure of Proteins

➤ SCIENTISTS may learn how proteins, the building blocks of our bodies, are put together by using a new method of mapping atoms in complicated crystals. X-rays and mathematics are teamed up in the new method developed by Drs. David Harker and J. S. Kasper of the General Electric Research Laboratory.

A beam of X-rays is shot through a crystal, which is made up of atoms arranged in some regular pattern, the experimenters explained. Atoms in the crystal diffract the X-rays to give a similar pattern on a photographic plate. From the relative darkness of the spots in this pattern, the exact arrangement of the atoms in the crystal can be mathematically calculated.

You can see for yourself how this works by holding a fine silk handkerchief or umbrella against the light from a distant street lamp. Sometimes a cross-shaped set of colored bands appears around the light. X-rays are very much like ordinary light, except that the waves in X-rays are shorter. The fibers in the silk affect the light beam just as the rows of atoms in the crystal affect the X-ray beam.

Electron beams produce similar diffraction patterns and can sometimes be used in place of X-rays. The new method works only on crystals which have some sort of symmetry, but this includes about 98% of all crystals, the scientists pointed out.

Science News Letter, August 16, 1947

IN SCIEN

CHEMISTRY

Solvent Selects Acetylene From Mixture of Gases

➤ ACETYLENE, one of the most valuable of industrial gases, can be concentrated out of the mixture of carbon monoxide, methane and other gases resulting from one production method by passage through a derivative of furfural which has a selective solvent action for this one particular gas. Discovery of this useful property in the solvent won patent 2,424,987 for Dr. Robert M. Isham of Okmulgee, Okla. Best compound for the purpose is tetrahydrofurfuryl acetate. Patent rights are assigned to Danciger Oil and Refineries, Inc., of Fort Worth.

Science News Letter, August 16, 1947

INDUSTRY

Alaska's Waste Salmon To Yield Valuable Products

➤ YEAR-ROUND industry for turning Alaskan salmon wastes into valuable products, including vitamins and drying oils, is being planned in a $47,000 project announced by the Department of Commerce's Office of Technical Services.

Hormones, amino acids, and resin bases will probably be on the list of recoverable products, valued at an estimated $5,000,000 to $10,000,000 annually. Alaska Fisheries Experimental Commission will do the work under contract with the industrial research and development division of OTS. The Commission's task is to find out just what chemicals can be recovered from the fish wastes and sold.

The Fish and Wildlife Service of the Department of the Interior and the Alaska Committee of the Department of Commerce are cooperating on the project.

Year-round storage of the wastes is another unsolved problem. Fish heads, tail pieces and inner parts are now being dumped into the sea or allowed to rot at the canneries. Byproducts plants would help Alaskan fish canneries and open more all-year jobs for fishermen in Alaska's biggest industry. The project also is being planned to help conserve fish resources.

Science News Letter, August 16, 1947

NCE FIELDS

DENTISTRY

Teeth Can Be Replanted Usually Only in Children

➤ IF JUNIOR falls down and knocks out a tooth, it can be replanted in his jaw. Not so, however, if his Dad gets a tooth knocked out.

Replanting of a tooth knocked out of its socket is successful only for children and usually fails in adults, Dr. Joseph T. Hartsook of the University of Michigan School of Dentistry reported at the meeting in Boston of the American Dental Association.

The shorter the interval between the accident and the time the child and his tooth reach the dentist, the better. First step in the replanting procedure is to take an X-ray to make sure the roots of adjacent teeth have not been damaged.

Care is taken to keep the tooth in good condition before replanting.

If the young patient is under school age, he is given a general anesthetic while the root canal is being sterilized and filled and the tooth replanted.

After replanting the tooth is held in place by wires attached to the sound teeth next to it. In many cases the tooth takes root again in two to four weeks.

Science News Letter, August 16, 1947

WILDLIFE

Too Much Water for Ducks Reason for Short Season

➤ TOO MUCH water, even for ducks; that is the news behind the news of the curtailed shooting season and sharply reduced bag limits established for this year by President Truman's proclamation. Detailed reports from the Canadian Department of Mines and Resources received at headquarters of the U.S. Fish and Wildlife Service confirm and extend the conclusions of American field biologists as to the growing seriousness of the duck shortage.

The same weather pattern that produced the disastrous Corn Belt floods drowned out large areas in the Canadian nesting grounds from which come most of the ducks that fly over the shooting-blinds in the eastern part of the United States.

In other Canadian duck nesting areas water conditions are much better but prospects for next fall are just as bad. Nesting sites are there aplenty, and more than enough water and duck food; but the breeding population is either greatly depleted or missing altogether.

The only region where both duck population and breeding conditions are anything like normal is in southern Alberta and Saskatchewan. Ducks from this part of Canada fly mostly over the western states.

Science News Letter, August 16, 1947

AERONAUTICS

GCA Equipment To Become Permanent CAA System

➤ RADAR ground control approach equipment to aid airplane landing in overcast weather, has proven so successful during trial at the national capital's airport, and also at New York and Chicago commercial airports, that all three are now to be made permanent.

The tryout equipment, known as GCA, was loaned to the U. S. Civil Aeronautics Administration for these installations by the Army Air Forces. By mutual agreement, they have now been donated outright. Civilian personnel, trained by Army men, will operate them.

GCA was developed during the war at the government's laboratory on the campus of Massachusetts Institute of Technology, and widely used in America and abroad, both by the Army and the Navy, in bad-weather landings. It is a system in which planes approaching a landing strip are spotted by the GCA land crew while still in the air, perhaps 50 miles away, by scanning radar equipment. The ground crew then gets in touch with an approaching pilot by ordinary radio and directs him to the proper position for immediate approach and on the downward glide until he is near enough the ground to see the strip and make the "touch" on his own.

Thousands of safe landings have been made by Army and Navy pilots on landing fields so enclosed in fog that they were entirely invisible from the air. The equipment is expensive, and its primary use at commercial airports will probably be as an assist to other instrument landing equipment and will be used in particularly dense weather.

Science News Letter, August 16, 1947

ZOOLOGY

Two Coyotes Entertain Yellowstone Park Visitors

➤ TWO COYOTES in Yellowstone National Park have been giving the bears keen competition for the tourists' attention—and food. During the past few weeks they have been begging for food along the main park highway between Midway Geyser Basin and Nez Perce creek, some 10 miles from Old Faithful geyser.

The coyotes have caused traffic jams seldom excelled by the so-called "bear jams". The two coyotes have been photographed extensively.

Yellowstone visitors in the past were lucky to even see a glimpse of gray coyote stalking his prey off the sagebrush plains or darting among the timber. However, the coyotes give the tourists a fine vocal show nearly every night with their loud yipping and barking.

For coyotes to beg for food and pose for pictures along the road has been until now unheard of in Yellowstone's colorful history.

This diamond anniversary year of the founding of Yellowstone Park finds two "little wolves" putting on a very unusual show, much to the delight of visitors.

Science News Letter, August 16, 1947

ANTHROPOLOGY

South African Ape-Man Had Beginnings of Chin

➤ FIRST PERSON in the world to stick out his chin was the very ancient ape-man of Sterkfontein cave in South Africa. Newest discovery of remains of this puzzling race is an almost complete lower jaw of a large male, only eight feet from the spot where the skull of an old female was found.

Drs. R. Broom and J. T. Robinson of the Transvaal Museum, describing this relic in the journal, *Nature*, state that "on the lower part of the front of the jaw there is a little bony thickening which might be regarded as an incipient chin." Lack of chin is what makes so many prehistoric races look unattractive to modern man.

Other features of the jaw are decidedly human, especially the teeth and the joint with the skull. "The whole jaw," state the discoverers, "is practically a human jaw."

Science News Letter, August 16, 1947

CHEMISTRY

Cloth Out of Test Tubes

Chemistry is the answer to the problems of shrinking, wrinkling natural fiber fabrics. Treated textiles last longer and can be made rot-proof as well as water-proof.

By A. C. MONAHAN

➤ DAINTY summer dresses need no longer muss; seersucker suits may remain fresh and presentable. Pleats in skirts and creases in trousers will seldom need renewal in the steam pressing shop. And summer woolens will be cool and never shrink.

Chemistry is the answer. Textile chemists have been busy during the past decade. New treatments, which give cloth longer life without altering the general appearance, add many other desirable qualities.

They tend to make them shrink-proof, water-proof, wrinkle-proof, rot-proof, distasteful to moths and mildew, and resistant to flame and stain.

War-Hastened

The war is not responsible entirely for the new cloth treatments, but it did hasten the development of some of the new chemicals used, and their applications. American clothing on soldiers and sailors went abroad, from frigid Baffin Bay to torrid New Guinea, to meet every known climatic condition in the world.

Special treatment of cloth for clothing, tents and other uses was essential to give them lasting qualities. Special weaves helped make some cloth warmer and others cooler. Water-proofing gave added comfort in all regions. Rot-proofing and mildew-proofing were important in the tropics. Flame-proofing aided fighting men wherever they were.

During war years, military needs held priority of the new materials. Now, however, they have been improved, adapted to general uses, and are available to the civilian population.

Traditionally, cloth and looms are always associated. Textiles are woven fabrics. Also traditionally, all cloth is made from natural fiber obtained from plants or animals. Textile fiber is now being made artificially from non-fibrous material in coal, corn cobs, soybeans, peanuts, milk, woodpulp, and even from sand converted chemically into glass in the form of very fine, but not transparent, fiber.

These synthetic fibers can be woven on a loom. A new process, however, makes the loom unnecessary. The fibers are laid close together, side by side and crosswise, and bonded with a resin, heat-treatment and pressure between rollers.

There are also cloths, or sheeting, made without fibers. The well-known Cellophane is an example. They are made of plastic materials, some more or less rubber-like, spread in thin sheets and subjected to a curing process. The familiar nylon used as a fiber in women's stockings and other garments can be used also in a non-fiber form.

The present so-called "plastics age" holds no threat over fiber growers and textile manufacturers. Someone must grow much of the materials used to make plastics. But there will always be a demand for woven goods. In fact, the best uses for some of the new materials are in treating textiles. The plastic best suited for making sheeting is finding one of its principal uses as a coating over woven cloth. Another use is in the plastic film field.

LADY IN GLASS—All fabrics are not made of natural or plastic fibers, one that isn't being cloth from glass fiber.

In the film field, the usual plastic used is either vinyl chloride or some of its close relatives. In the fabric coating field, the older materials, such as nitrocellulose, rubber, oils and alkyds, are being supplemented with vinyl resins. Vinyl chloride and its so-called copolymers make up the bulk of these coating materials. Vinyl butyral forms a coating over cloth that is practically invisible.

Whether made of natural or synthetic fiber, woven or bonded, most cloths can be treated or so made that they have many desirable properties unknown in fabric of the past. Non-shrinking shirts and collars, and dresses that do not catch afire easily will add to comfort on one hand and safety on the other. Combustible clothing, accidentally touching a gas flame, has caused the death of many children.

New Fiber Treatment

Among the new fiber-treating materials is one with Resloom for a trade name, made by Monsanto Chemical Company. This synthetic chemical is relatively new but already has been well tested. Rayon goods treated with it are on the market. Cotton and woolens will follow. Exhaustive tests on both have now been made.

One of its principal abilities is to decrease shrinkage, even of woolens, to a negligible amount. When treated with Resloom, wool shrinkage is only about 3% as compared with the usual 25% to 50% of the same fabrics untreated. In addition it stabilizes the wool so that extremely thin cloth suitable for summer all-wool garments can be woven.

Resloom is a resin known chemically as melamine formaldehyde. When wool, cotton or rayon is treated with it, the chemical enters the heart of the fiber and remains there for the life of the cloth. The basic fiber is not injured. Goods treated may be washed or dry-cleaned and ironed as usual. Resloom can be used with known water-repellents, fire-retardants and anti-mildew agents. The Resloom itself prevents mussing and gives the long-life crease in men's trousers.

Aerotex Cream 450 is the trade name of a product of the American Cyanamid Company. One of the chief resins used for spun rayon and rayon mixtures, it is a popular resin for crease-proofing linens as well as certain cotton fabrics,

particularly voiles. It is a water-soluble, partially condensed, urea formaldehyde resin in paste form. Because of the small size of its molecules it can penetrate the textile fiber. A curing process fixes it within the fiber cells.

When applied to certain fabrics under the minimum of tension, shrinkage control is also obtained. When used in combination with another resin made by the same company, permanent water repellence and anti-crease finish are obtained in one bath.

Rot-proof cotton cloth is something new in the textile field. It is not a quality particularly essential in the clothing field but, being mildew-proof as well, is suitable for garments to wear in hot countries. Its greatest value is in cloth that is in contact with the ground, but also in tents, awnings and bags for fruits and vegetables.

This rot-proof cotton is a development of the U. S. Department of Agriculture in its research laboratory at New Orleans. It is a modified cotton, a partially acetylated cotton somewhat related to rayon made by the acetate process. In tests it failed to rot during six months under ground in soil where ordinary cotton would rot in a week or two.

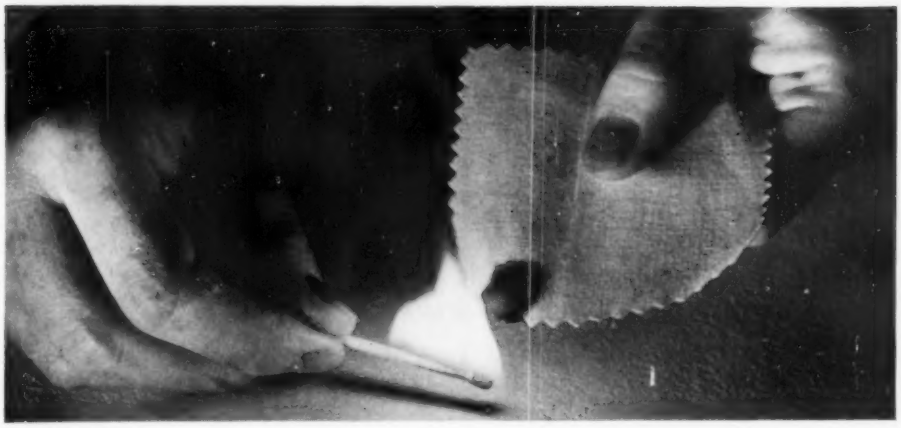
Not All for Clothes

Not all of the new chemically or otherwise treated fabrics are designed for clothing. Some are treated to assure longer life when used in upholstery or to provide beauty and safety from fire hazards when used as draperies. Flame-resistant fabrics are essential in night clubs and other public places where people assemble.

Other fabrics are treated for easy cleaning. A new table cover which resembles ordinary linen, can be kept clean on the table by wiping with a damp rag. Still others are waterproof sheeting for hospital and other uses. These can be made into raincoats and capes, and into protecting panties for baby.

Then, there is a gold- or silver-colored fabric that has many decorative uses in the home although designed for use in public places. It is a metal-coated plastic fabric that has a mirror-like finish. Its trade name is Miromesh, and it is made by the National Research Corporation.

The base material in this fabric is a mesh that resembles wire screening with the spaces filled with a cellulose acetate film. The fiber of the mesh is a well-known plastic called Saran, a compound of polyvinylidene chloride, which is highly resistant to most chemicals.



NON-INFLAMMABLE—Treatment makes fabrics resistant to flames and water.

The mesh, filled with the acetate, is coated on one side with a thin film of aluminum applied by a high-vacuum process. This is covered with a protective lacquer. Over the silver finish, it is a clear lacquer; a gold-colored lacquer is used for the gold finish.

Beautiful draperies that defy fire, made by Plymouth Fire-Guard Fabrics, are woven of a combination of very fine glass fiber and flame-proofed cotton yarn. They are designed particularly for use in public places but are suitable in homes. They come in a wide range of colors and can be dry-cleaned, cut, sewed and ironed as easily as all-cotton materials.

In the future, the buyer of clothing will have to go further than the looks and the feel of the fabric. He will have to take the manufacturer's word for the invisible substances contained and, until tested, his word for the special qualities added to the cloth.

Science News Letter, August 16, 1947

DENTISTRY

Dental Drilling Painless With Topocaine Anesthetic

➤ A NEW anesthetic for taking the pain out of the dentist's drill was announced by Dr. Gustav William Rapp of Loyola University School of Dentistry at the meeting in Boston of the American Dental Association.

The anesthetic is put right on the spot that would hurt when the dentist drilled. It is not necessary to inject it into the gun by hypodermic needle. In limited tests it was succesful in three out of four patients.

The anesthetic is a mixture of two older ones, procaine and benzocaine, in an alcohol solution. In most cases it takes only one or two minutes to take effect.

Dr. Rapp said that additional experimentation will be necessary before the new anesthetic, which he calls topocaine, can be recommended for general use by dentists.

Science News Letter, August 16, 1947

AERONAUTICS

Scout and Rescue Plane Passes Rough Water Tests

See Front Cover

➤ THE NEW Navy Seahawk, the Curtis SC-2, has completed successful rough water landing tests at the Naval Air Test Center in Patuxent, Md., after repeated take-offs and landings simulating conditions encountered in the open sea.

The new seaplane is a version of the Curtis SC-1 which made its first flight early in 1944. The SC-1 took active parts in warfare later, its first action being in 1945 in the pre-invasion bombardment of Borneo. It is a low-wing monoplane with wings that fold back for storage on shipboard. It is a single-seat affair.

The new Seahawk is much like its brother but is a more rugged plane that can withstand rough water when afloat. This is important because this ship-borne plane is not only a scout and fighter but is also a rescue craft. One feature of the new version is a separate door which allows a person rescued from the sea entry to a compartment and seat behind the pilot.

Science News Letter, August 16, 1947

Molds grow on anything from which they can get enough food.

Do You Know?

Fatal accidents in U. S. National Parks during 1946 numbered 29.

A *bullet* will ricochet off the surface of water as it does from a solid surface.

Much of the world's fertile *farm lands* of today were sea bottoms in very ancient times.

Wood *gutters* on houses have become common recently due to shortages of metals.

Seashell collecting, a summer sport to many, is to scientists a help in unravelling a geological structure in a quest for oil, metals, or deposits of building materials.

Visitors to an *electronic* exhibition in New York can see themselves televised and at the same time see the television picture of themselves on a screen.

American *tung-oil* industry, although still young, is reaching $10,000,000 proportions; tung tree orchards are now located in all the states touching the Gulf of Mexico.

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ASTRONOMY

1947 Record Comet Year

➤ THIS YEAR may set a new record for the discovery of comets, a Harvard College Observatory astronomer disclosed.

So far this year, astronomers have found eight new comets in the heavens. The all-time yearly record was set in 1932 when 13 comets were discovered.

"If we keep on at the present rate, 1947 may become the record year in the discovery of new comets," Dr. Fred L. Whipple explained.

Dr. Whipple, who discovered one of the most spectacular new comets of the past two decades, discussed comet-hunting as a guest of Watson Davis, director of Science Service, on Adventures in Science heard over the Columbia network.

Although astronomers have found a bumper crop of new comets this year, you would not have been able to see any of them without a powerful telescope. The only comet found this year which has been visible to the naked eye could be seen only in the Southern hemisphere.

Comet-finding is an international job, Dr. Whipple emphasized. Ten comets, including newly-discovered and previously-known ones, are now being observed by astronomers. These 10 discoveries were made in eight different countries, the astronomer reported.

Observations from almost all of the civilized countries of the world are used when astronomers calculate the paths of comets about the sun, Dr. Whipple added.

Comets appear as a hazy patch of sky, but actually they are millions of miles away, the astronomer pointed out.

These August nights, you can see the annual shower of the broken remains of a comet, Dr. Whipple said. The pieces of the comet are shooting stars, or meteors.

Each August, he explained, we can see the Perseid meteors, which seem to come from the constellation Perseus, the champion. Actually these shooting stars are the skeleton fragments of a comet discovered in 1862.

Dr. Whipple predicted that meteors will become a traffic hazard when man starts traveling out into space.

One might cruise around in space for a lifetime without colliding with a meteor, but the driver of a space ship will have to avoid the paths of comet debris where meteors are most likely to be.

"He should try to avoid running through the orbits of the larger comets where much meteoric matter might exist," Dr. Whipple said, "in the same fashion as a bus driver should try to avoid driving over tacks, nails and rough roads that might ruin his tires."

Colliding with meteors would be a more serious matter, though. These so-called shooting stars move at high speeds, and the astronomer estimated that a pinhead meteorite, if made of steel, would penetrate a quarter-inch steel plate.

Science News Letter, August 16, 1947

ENTOMOLOGY

Beehive Air-Conditioning Pays Keeper in More Honey

➤ AIR CONDITIONING for bees pays, Leroy Bell of Orange, Calif., has found. He keeps his beehives—42 of them—inside a long chamber in which temperature and humidity can be controlled at levels the bees like best. They aren't what human beings would find comfortable, for optimum temperature from the bees' viewpoint is between 80 and 85 degrees Fahrenheit, with relative humidity from 60% to 65%.

Under these living conditions Mr. Bell's bees are so good-natured that he can work on the hives without headnet or gloves. He states that they produce more honey, rear better queens, and are less apt to raid neighbor-colonies to steal honey.

Science News Letter, August 16, 1947

CHEMISTRY

Coloring Ripe Oranges

➤ BECAUSE some varieties of oranges are not orange when they are fully ripe, it is considered legitimate to dye their skins to a more attractive hue. An improvement in this cosmetic treatment, consisting of a thin wash of a wax in which an oil-soluble pigment is dissolved, is protected by patent 2,425,073, granted to J. N. Sharma of West Los Angeles, Calif.

Science News Letter, August 16, 1947

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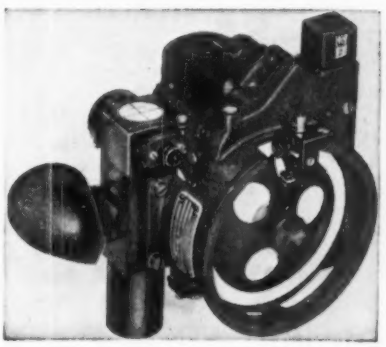

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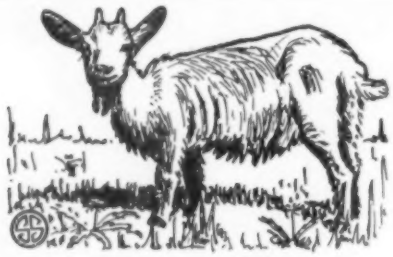
ECOLOGY

NATURE RAMBLINGS
by Frank Thone



Goats Play the Devil

➤ SATAN, in modern comic and semi-serious art, is drawn as a man with several decidedly goatish features. He has cloven hooves, and goat's horns top a long capricious countenance that usually has a "goatee" at its lower extremity. Sometimes, too, his ears stick out like a billy-goat's.

Sometimes it is contended that these symbolisms are simply transfers from the ancient Greek goat-god, Pan. That may or may not be true historically. If it is, however, it would assign to Pan a role much deeper and more malicious than the mere untamable, irresponsible freedom which Pan was supposed to symbolize. For real, flesh-and-blood goats, pastured by people for their wool and milk and meat, quite literally play the devil with the land over which they trample and nibble. They represent the last, hungriest, most destructive stage of over-grazing.

Cattle and horses may crop the grass down to the last inch if too many of them are run on the range. Sheep will take that last inch, leaving only the roots in the ground. Goats will take even the roots, and thereafter browse on the woody shrubs that invade the pastures when grasses and other good herbs have been all eaten up. In the meantime, their restlessly trampling, sharp-edged hooves keep the soil surface cut up, ready to blow with the wind or wash with the rain.

This is not an imaginary cycle. It has happened over and over again, especially in the Mediterranean lands. Pan, the goat-god, was not only a denizen of the rocky wilderness. He was to a considerable extent the creator of the wilderness.

The ultimate devil in the destruction of the land, however, is neither Pan nor his four-footed prototypes. Man, not Pan, must take the final responsibility. For goats, however wild they may run, are brought into new places by human herdsmen. If their numbers become such as to loose the damnation of erosion on the land, it is due either to the need or the greed of the men who control the size of the herds.

Thus far, in our own West, we are in the cattle-and-sheep stage of over-grazing. Goats have not yet entered the picture as an important element. If we keep on at the present clip, another generation or two may see little horns and sharp hooves where bison and antelope were in balance with nature a couple of generations ago. Then we shall know that America has been added to the world's list of hungry lands.

Science News Letter, August 16, 1947

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DENTISTRY

Use of Sodium Fluoride

Chemical shows great promise in curbing tooth decay but must be used with caution. Four applications to teeth are necessary.

➤ ENTHUSIASTIC reports on sodium fluoride as a means of curbing tooth decay, with caution against misuse of this chemical, were presented at the meeting in Boston of the American Dental Association.

Applying this chemical to the teeth of children under 12 years has reduced tooth decay as much as 40%, Dr. John W. Knutson, senior dental health surgeon, U. S. Public Health Service, reported.

He called sodium fluoride "one of the most promising chemicals in curbing dental decay among children."

Four applications of a 2% solution of the fluoride are necessary to achieve the desired results. Treatments, he said, should be completed in one to two months.

This use of sodium fluoride followed the discovery some years ago that small amounts in the drinking water materially reduced the amount of tooth decay in children who drank such water during the years their teeth are being formed. As a result, a number of communities have started adding small amounts of fluorine to their water supplies.

How the fluorine acts to prevent tooth decay is not known but it is agreed the chemical makes tooth enamel harder to dissolve in acid.

The American Dental Association has recommended that all dentists apply dilute solutions of the chemical to the teeth of all child patients during the course of routine dental treatments.

Fluorinated tooth pastes and powders and mouth washes, however, have not proved effective in controlling decay, Dr. F. J. McClure, of the U. S. Public Health Service's National Institute of Health, declared.

He warned against the use of fluoride tablets, or pills, unless taken under a dentist's or doctor's prescription. Too much fluorine, he pointed out, can cause ugly mottling of the teeth and can damage the kidneys.

Science News Letter, August 16, 1947

GENERAL SCIENCE

Latin American Scientists Win Grants for Work Here

➤ LATIN-AMERICAN scientists will conduct studies in fields ranging from earthquakes to medicine in this country under John Simon Guggenheim Memorial Foundation fellowships.

A total of 29 Latin American fellowships have been granted with total stipends of $80,000. The fellowships are granted to scientists, scholars and artists of 11 Latin American nations and Puerto Rico.

Science News Letter, August 16, 1947

Books of the Week

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AMERICAN HISTORY FILMS—Anne B. Cridlebaugh and Lili Heimers—*N. J. State Teachers College,* 9 p., paper, 25 cents. A selected list for senior high schools.

THE ANNUAL OF THE AMERICAN SCHOOLS OF ORIENTAL RESEARCH, Vol. XXIV for 1944-1945—Millar Burrows and E. A. Speiser, eds.—*Am. Schools of Oriental Res.,* 138 p., illus., $3.50. This volume contains a description and discussion of over 1000 seal impressions on tablets discovered at Nuzi prepared by Dr. Edith Porada.

THE ARBORETUMS AND BOTANICAL GARDENS OF NORTH AMERICA—Donald Wyman—*Chronica Botanica,* Vol. 10, No. 5/6, 97 p., illus., paper, $1.50. A documentary account of the existing botanical gardens, their location, method of establishment and types of work pursued.

BOISSIÉRE'S PYTHAGOREAN GAME—John F. C. Richards—*Scripta Mathematica,* 40 p., paper, 50 cents. A translation of Boissiére's treatise on the game, Rythmomachia, the harmony and battle of numbers.

CONCISE ANATOMY—Linden F. Edwards—*Blakiston,* 548 p., illus., $5.50. A text for students in a wide variety of fields: nursing, physical therapy, dental hygiene, physical education, medical technology, embalming, etc.

THE ENGRAMMES OF PSYCHIATRY—J. M. Nielson and G. N. Thompson—*Thomas,* 509 p., $6.75. A presentation of the anatomy and physiology of human behavior.

ENZYMES AND THEIR ROLE IN WHEAT TECHNOLOGY—J. A. Anderson—*Interscience,* 371 p., $4.50. The first volume of a series of monographs sponsored by the American Association of Cereal Chemists; only those enzymes of particular interest to cereal chemists are discussed.

FIRST SESSION OF THE GENERAL CONFERENCE OF UNESCO: PARIS NOVEMBER 19-DECEMBER 10, 1946: Report of the United States Delegation—U. S. Dept. of State—*Govt. Printing,* 157 p. paper, 35 cents. A statement of their achievement and program for 1947.

FREE TEACHING AIDS—Lili Heimers—*N. J. State Teachers College,* 19 p., paper, 50 cents. Addresses from which may be obtained charts, maps, publications, pictures, etc., free, suitable for all age groups.

GRAPTOLITES OF NORTH AMERICA—Rudolf Ruedmann—*Geol. Soc. of Am.,* 652 p., illus., $9. A study of the 700 species, varieties, and mutations of North American Graptolites, establishing the distribution of all forms on this continent.

HEAT PUMPS—Philip Sporn, E. R. Ambrose, and Theodore Baumeister—*Wiley,* 188 p., $3.75. A discussion of the problems involved in adapting the heat pump not only to building heating and cooling, but to applications in the industrial field for evaporation and purification of liquids, drying of solids, and simultaneous heating and chilling of process fluids.

THE INSECT CRANIUM AND THE EPICRANIAL SUTURE—R. E. Snodgrass—*Smithsonian Misc. Coll.,* Vol. 107 No. 7, 51 p., illus., paper, 40 cents. A new interpretation of the anatomical facts of the epicranial suture.

A MANUAL OF BEEKEEPING FOR ENGLISH-SPEAKING BEEKEEPERS—E. B. Wedmore—*Longmans,* 2nd ed. rev., 389 p., illus., $5. Additional help for the bee-keeper who is not a beginner: condensed technical information on queen-raising, swarming, diseases, etc. presented.

MATHEMATICS: Visual and Teaching Aids—Frances Goon, Charles W. Martin, and John J. O'Brien Jr.—*N. J. State Teachers College,* 30 p., paper, 75 cents. List of pamphlets, films, slides, charts, etc.

NURSING CARE IN CHRONIC DISEASES—Edith L. Marsh—*Lippincott,* 237 p., illus., $3. A discussion of the problems involved with different types of chronically ill patients, specific nursing and therapy.

ONE HUNDRED YEARS IN YOSEMITE—Carl Parcher Russell—*Univ. of Calif.,* rev., 226 p., illus., $3.75. An account of the discovery and preservation of Yosemite, including a chronology of events connected with the park and an extensive bibliography.

PHYSICS—Constance Marie Conroy and Helen Ward Mackay—*N. J. State Teachers College,* 25 p., paper, 50 cents. A selected list of aids to teaching: charts, exhibits, films, slides, publications, and recordings.

PRECISION SHOP MATHEMATICS—William Herbert Edwards—*Heath,* 314 p., illus., $2.48. A text for technicians enrolled in trade extension classes and to meet the mathematical needs of shop men.

REPORT ON THE AGRICULTURAL EXPERIMENT STATIONS 1946—U. S. Dept. of Agric., Office of Expt. Stations.—*Govt. Printing,* 172 p., paper, 35 cents. A summarized account of the various research projects undertaken and their progress; development of new varieties of grain, berries, improved animal nutrition, vegetables, human nutrition and home management.

RUSSIAN DANDELION (KOK-SAGHYZ) AN EMERGENCY SOURCE OF NATURAL RUBBER—W. G. Whaley and J. S. Bowen, comp.—*U. S. Dept. of Agric.,* Misc. Publ. No. 618, 212 p., illus., 55 cents. A summary of investigations conducted from June 1942 to June 1944, during which time experiments were conducted on the large-scale production of this plant as a source of rubber.

SIGNS AND SYMPTOMS; Their Clinical Interpretation—Cyril M. MacBride—*Lippincott,* 439 p., illus., $12.00. Of practical value to the physician in helping him obtain pertinent descriptions of symptoms from the patient and interpret them.

SOME IMPLICATIONS OF THE CERAMIC COMPLEX OF LA VENTA—Phillip Drucker—*Smithsonian Misc. Coll.,* Vol. 107 No. 8, 9 p., illus., paper, 20 cents. Indicating a culture growth for the Meso-American, the result of interchanges between a number of local centers instead of one single Mayan fountainhead.

UNUSUAL WORDS; How They Came About—Edwin Radford—*Philosophical Lib.,* 318 p., $3.75. A collection of the principal proverbial "tags," phrases and words, together with their origins and derivations.

VERTICAL FLIGHT—Parlee C. Grose—*General Pub.,* unpaged, illus., paper, $1. A discussion of various factors involved, including sections on "beedynamics," rotary wing, and Magnus-effect rotor lift.

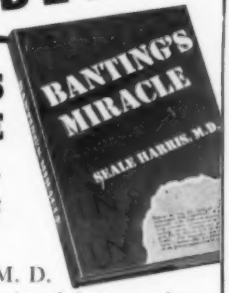
WHEN THE EARTH QUAKES—James B. Macelwane, S. J.—*Bruce,* Science and Culture Series, 283 p., illus., $5. A dramatic presentation of the movements of our earth, their measurement, prediction, and interpretation in the light of geophysics.

THE YEARS AFTER FIFTY—Wingate Johnson—*Whittlesey House,* 153 p., $2. Designed to help the person approaching old age prepare sensibly for this period mentally, physically and spiritually by discussing various problems which may arise.

Science News Letter, August 16, 1947

A very high *ceiling* may be made to appear lower by carrying the ceiling color down the sidewalls to the tops of the windows.

A STORY FOR DIABETICS



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❁ *ATTACHMENT to a paint brush keeps paint off window panes when painting sash. It consists of a broad arrow-shaped light metal guard on the end of a flat spring fastened to the brush handle, which fits over the bristles and holds them away from wrong surfaces. The guard slides up the spring when not needed.*

Science News Letter, August 16, 1947

❁ *VISIBILITY METER, for measuring night visibility of traffic paint and roadside signs, is a visual instrument within which light reflected from the paint is compared in brightness to an illuminated comparison panel attached within to a numerical scale. The panel is rotated by the operator.*

Science News Letter, August 16, 1947

❁ *SOFT DRINK VENDER automatically serves a cup of Coca-Cola when a nickel is inserted in a slot. Mechanism drops a paper cup into place, and delivers into it syrup and carbonated water under pressure. The customer lifts a small glass window to get his drink. The device automatically makes change for a dime or quarter.*

Science News Letter, August 16, 1947

❁ *PENCIL SHARPENER, electrically operated and shown in the picture, gives a medium, fine or superfine point by regulating a three-position lever. Housed in molded plastic, it contains a drawer to catch the sharpenings. A draftsman's model sharpens only the wood, leaving the lead untouched.*

Science News Letter, August 16, 1947

❁ *ELECTRIC HEATER for kitchen uses, ranging from frying eggs, browning pies, and defrosting refrigerators to removing paint, is carried in one hand like a skillet, the six-inch heating housing being elongated and tapered. The housing is so shaped that all heat is radiated in one direction.*

Science News Letter, August 16, 1947

❁ *NON-SKID MAT, designed particularly for home or factory workers who stand long periods at table or bench, has both upper and lower surfaces covered with hundreds of quarter-inch-high rubber cones. It cushions the feet, protects from damp floors, and prevents shocks from static electricity.*

Science News Letter, August 16, 1947

❁ *GLARE SHIELD for automobile drivers, for attachment to the windshield by a rubber suction cup, can be swung up or down by a flip of the finger when not needed. Made of a tinted plastic, it cuts the glare while the driver watches the road by looking above or below the shield.*

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Question Box

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Pictures: *Cover, U. S. Navy; p. 99, Rohm & Haas Co.; p. 101, Philadelphia Zoological Society; p. 103, Army Air Forces; p. 107, Science Service.*

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